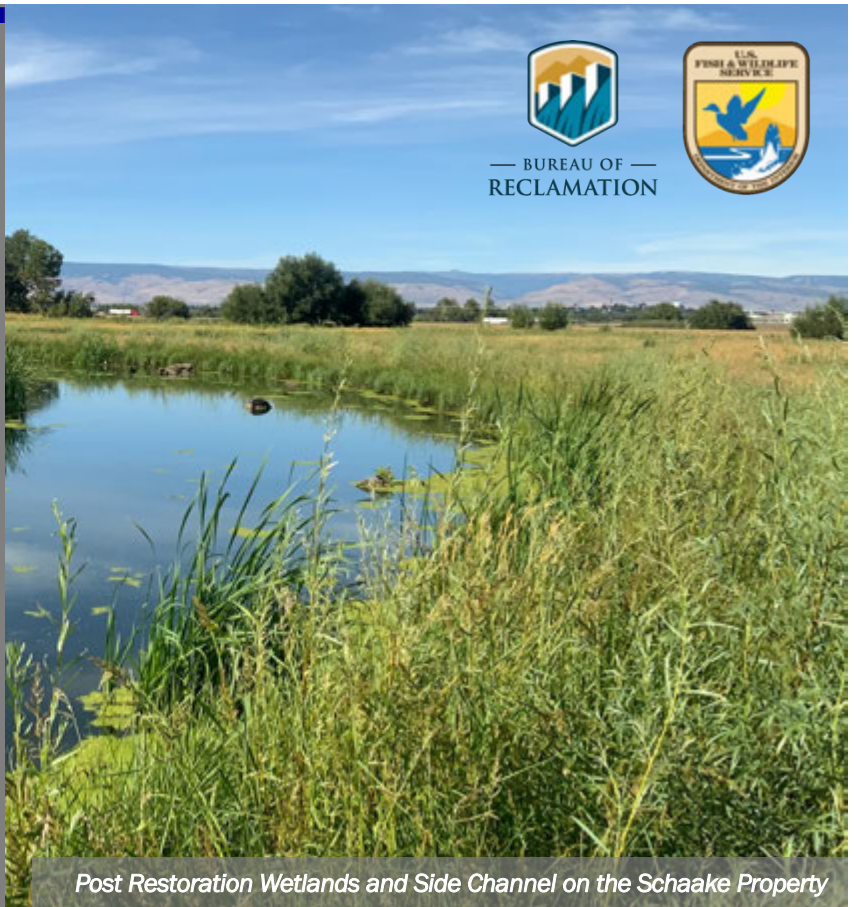
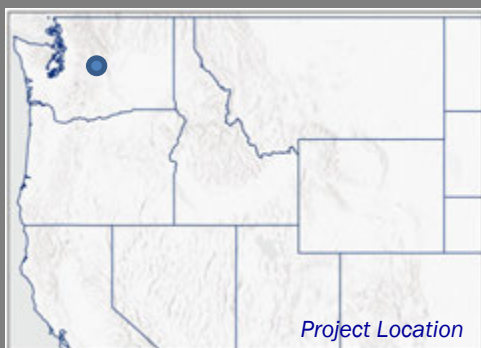


## RESTORATION

# Floodplain Restoration for Salmonid Habitat in the Yakima Basin



Salmonid species, including endangered Middle Columbia River steelhead (*Oncorhynchus mykiss*) and bull trout (*Salvelinus confluentus*), have declined within the Yakima River Basin due to fish passage barriers and widespread habitat degradation. Levees within the Schaake reach of the Yakima River have prevented floodplain connectivity, resulting in the loss of side channels that provide critical juvenile salmonid habitat. The Schaake Habitat Improvement Project, completed by the Bureau of Reclamation (Reclamation) in collaboration with several partners, improved salmonid habitat by removing levee portions and constructing a flood protection berm to restore 130 acres of floodplain.



— BUREAU OF  
RECLAMATION —



## KEY ISSUES ADDRESSED

The project area contained levees that interfered with the Yakima River's floodplain connection, resulting in salmonid habitat and refugia loss in side channels. Reclamation also sought to offset artificial wetland loss in the valley, the by-product of modernizing irrigation infrastructure, by enhancing existing, and creating new, wetlands. Nearby critical infrastructure, including a railroad, highway, and power lines, necessitated the incorporation of flood risk mitigation into the planning process. Reclamation aimed to address floodplain connectivity issues and wetland enhancements while also considering human interests such as infrastructure, irrigation supply, and existing land use.

## PROJECT GOALS

- Restore the connection between the Yakima River and its floodplain
- Create side channels and wetlands to create refugia and habitat for juvenile salmonids
- Promote natural hydrological processes while limiting flood risk to protect infrastructure in the surrounding area

## HABITAT FOR ALL

Increased habitat complexity and availability of breeding areas provided by LWM installation, native species seeding, and more frequent floodplain inundation benefit other native species like elk.



After Side Channel Reconstruction

## PROJECT HIGHLIGHTS

**Flood Protection:** Modeling performed by the project team determined which parts of the Schaake levee should remain in place in order to protect surrounding infrastructure. Engineers achieved further flood protection by constructing a three-foot-high and approximately 0.7-mile-long berm using the material from onsite construction.

**Habitat Creation:** Construction crews recontoured the floodplain to create 1.8 miles of perennial side channels that would re-establish hydraulic connectivity and reinvigorate existing side channels. These side channels provide refugia for juvenile salmonids.

**Large Woody Material (LWM) Installation:** Construction crews installed log structures in the floodplain to increase stability during flooding. They also placed LWM and small woody material in select areas along the mainstem, in side channels, and in wetlands to improve hydraulic function and create habitat for juvenile salmonids.

**Floodplain and Wetland Restoration:** The removal of much of the Schaake levee resulted in 130 acres of natural floodplain reconnected to the Yakima River. Floodplain contouring also created side channels connecting wetlands to increase inundation frequency. These actions increased not only wetland function, but also attenuation of flood flows, access to high-flow refugia for salmonids, and enhanced riparian habitat.

## Collaborators

- See online for full list of collaborators

CCAST Author: Kate Richter, University of Arizona, April 2023.

Photos courtesy of Tim DeWeese/BOR

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## LESSONS LEARNED

Effective project strategies included using the natural features of the Schaake property and in-house expertise. Engineers designed side channels to connect natural low-points and wetlands on the Schaake property. Relying on in-house construction teams improved project efficiency. Having both the design and construction crews be part of Reclamation allowed for design flexibility and streamlined communication.

Legislative authority to purchase land for improving water management and habitat in the Yakima basin meant Reclamation was already looking for opportunities to improve critical areas in the basin. The large size of the Schaake property and the proximity to the river enabled Reclamation to implement one of the largest floodplain restoration projects in the basin.

The Schaake project can serve as an example that other government agencies can draw on as they undertake their own restoration projects along the Yakima River. Completion of similar floodplain restoration projects will ultimately result in one large integrated area of restored floodplain.

## NEXT STEPS

- Complete fish surveys to quantify the project's success
- Continue revegetation efforts to establish native grasses and an overstory of trees, shrubs, and herbaceous species
- Explore how to implement recreational opportunities on the property

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During Side Channel Reconstruction